Comparison of motor, cognitive rehabilitation and a combination therapy effects on cognitive impairment in MS patients: preliminary data from an ongoing study.

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Introduction

Motor and cognitive impairments (CI) are the main clinical features of Multiple Sclerosis (MS) with an incidence of around 85% for the former and 65 % for the latter. Cognitive deficits are less visible to patients and usually not influenced by pharmacological treatments. Aim of the present study was to compare three formats of cognitive and motor rehabilitation programs in order to understand which is the most efficient in reducing memory impairment in MS patients.

Methods

A initial group of 31 patients (20 RR and 11 SP) was submitted to detailed neuropsychological testing with the Italian version of the MACFIMS battery (Argento et al., 2018), before (T0) and after (T1) being randomly attributed to one of three rehabilitation conditions (two cognitive training/week-C1; one cognitive and one motor training/week-C2; two motor training/week-C3, for 12 weeks). Pre- and post- cognitive evaluation was performed in order to derive the global Cognitive Impairment Index (CII) for each participant. The cognitive rehabilitation was focused on memory functioning and performed with Rehacom (http://www.emsmedical.net).

Table 1. Comparison between pre- and post- treatment CII in the three groups

	T 0 CII	T 1 CII	t-Test Sig.
C 1 (n=8)	14,5 ± 7,5	11,62 ± 8,3	.041
C 2 (n=12)	11,15 ± 4,1	7,83 ± 4,4	.000
C 3 (n=11)	8,63 ± 5,7	7,91 ± 6,2	.512

Table 2: Percentage of patients in the three levels of CI before and after the three-months tratment period.

	T 0 CII			T 1 CII		
	Preserved	Mildly	Severely	Preserved	Mildly	Severely
C 1 (n=8)	2	3	3	5	2	1
%	25%	37,50%	37.5%	62,50%	25%	12,50%
C 2 (n=12)	6	4	2	10	1	1
%	50%	33,30%	16,70%	83,33%	8,33%	8,33%
C 3 (n=11)	7	2	2	7	3	1
%	63,60%	18,20%	18,20%	63,60%	27,30%	9,10%

Results

The patients were distributed as follows: 8 patients in C1; 12 patients in C2; 11 patients in C3. No significant differences in age, sex, education and disease course were found between the three conditions (sig.>.05). From the t-test performed between pre- and post- treatment groups, the global CII improved significantly in both C1 and C2 groups, while in the C3 group no significant difference was found. In particular, in C1 group at T0 evaluation only 25% of patients resulted cognitively preserved, while at the T1 they become 62.5%. The same pattern was found in C2 group in which preserved patients were 50% at T0 and become 83.3% at T1.

Conclusions

These preliminary data confirm that to include a cognitive training within rehabilitation programs may induce important benefits in MS patients. Furthermore, they seem to benefit more from a combined approach (cognitive and motor) than from separate single training conditions (C1 and C3). Rehabilitation programs combining motor and cognitive treatments could give a stronger advantage in the improvement of cognitive impairment due to MS. These preliminary results need to be confirmed by a trial with a wider sample but they represent, however, an encouraging incentive to continue.

References:

•Argento, O., Incerti, C. C., Quartuccio, M. E., Magistrale, G., Francia, A., Caltagirone, C., ... & Nocentini, U. (2018). The Italian validation of the minimal assessment of cognitive function in multiple sclerosis (MACFIMS) and the application of the Cognitive Impairment Index scoring procedure in MS patients. *Neurological Sciences*, *39*(7), 1237-1244.

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